COSEWIC
Status Appraisal Summary

on the

Blue Whale
Balaenoptera musculus

Atlantic population

in Canada

ENDANGERED
2012

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada

COSEPAC
Comité sur la situation
des espèces en péril
au Canada

COSEWIC status appraisal summaries are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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Également disponible en français sous le titre Sommaire du statut de l'espèce du COSEPAC sur le Rorqual bleu (*Balaenoptera musculus*) (population de l'Atlantique) au Canada.

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COSEWIC
Assessment Summary

Assessment Summary – May 2012

Common name
Blue Whale - Atlantic population

Scientific name
Balaenoptera musculus

Status
Endangered

Reason for designation
Whaling reduced the original population of this species. The population size is unknown but there are likely fewer than 250 mature individuals in Canada. There are also strong indications of a low calving rate and a low rate of recruitment into the population. The known causes of human-induced mortality of this species in Canada and elsewhere are ship strikes and entanglements in fishing gear. The species may also be vulnerable to disturbances due to increased noise in the marine environment and to changes in the abundance of its prey (zooplankton) through, for example, long-term changes in the climate.

Occurrence
Atlantic Ocean

Status history
The species was considered a single unit and designated Special Concern in April 1983. Split into two populations in May 2002. The Atlantic population was designated Endangered in May 2002. Status re-examined and confirmed in May 2012.

COSEWIC
Status Appraisal Summary

Balaenoptera musculus
Blue Whale (Atlantic population)
Jurisdictions: Atlantic Ocean

Rorqual bleu (Population de l'Atlantique)

Current COSEWIC Assessment:

Status category:
☐ XT ☒ E ☐ T ☐ SC

Date of last assessment: May 2002

Reason for designation at last assessment:
Whaling reduced the original population. There are fewer than 250 mature individuals and strong indications of a low calving rate and a low rate of recruitment to the studied population. Today, the biggest threats for this species come from ship strikes, disturbance from increasing whale watch activity, entanglement in fishing gear, and pollution. They may also be vulnerable to long-term changes in climate, which could affect the abundance of their prey (zooplankton).

New reason for designation (only if different from above):
Whaling reduced the original population of this species. The population size is unknown but there are likely fewer than 250 mature individuals in Canada. There are also strong indications of a low calving rate and a low rate of recruitment into the population. The known causes of human-induced mortality of this species in Canada and elsewhere are ship strikes and entanglements in fishing gear. The species may also be vulnerable to disturbances due to increased noise in the marine environment (e.g., shipping, seismic surveys) and to changes in the abundance of its prey (zooplankton) through, for example, long-term changes in the climate.

Criteria applied at last assessment: A1bd; D1

If earlier version of criteria was applied[1], provide correspondence to current criteria: Not applicable

If different criteria are proposed based on new information, provide explanation: A2abd, D1

A2abd: Meets Endangered under A2abd as over the past 3 generations (i.e. since ca. 1915) there has been a suspected decline of more than 50% in the total number of mature individuals based on the low numbers of individuals observed in recent surveys (a), the difficulty whalers had in finding and catching Blue Whales (preferred targets) in the last years of commercial whaling (b), and high levels of historic commercial exploitation (d). The cause of the reduction (commercial whaling) has ceased and is understood but the reduction may not be reversible. Although the cause of the reduction (commercial whaling) has ceased, its effects may not be fully understood and the reduction may not be reversible given the lack of evidence of strong recovery despite 45+ years of full protection from whaling.

D1. Meets Endangered under D1 as the number of mature animals is likely less than 250, based on the results of a DFO survey in 2007 covering waters from northern Labrador to the US border and including the Gulf of St Lawrence, in which only five Blue Whales were sighted off Newfoundland and 11 in the Gulf

[1] An earlier version of the quantitative criteria was used by COSEWIC from October 1999 to May 2001 and is available on the COSEWIC website: http://www.cosewic.gc.ca/eng/sct0/original_criteria_e.cfm

and Scotian Shelf.

If application of current specific criteria is not possible, provide explanation: Not applicable

Recommendation: Update to the status report NOT required (wildlife species' status category remains unchanged)

Reason:

☒sufficient information to conclude there has been no change in status category

☐not enough additional information available to warrant a fully updated status report

Evidence (indicate as applicable):

Wildlife species:

Change in eligibility, taxonomy or designatable units: yes ☐ no ☒

Explanation:

There is no new information to indicate that the taxonomic or DU status of the Atlantic population of Blue Whales has changed.

Range:

Change in Extent of Occurrence (EO): yes ☐ no ☐ unk ☒
Change in Area of Occupancy (AO): yes ☐ no ☐ unk ☒
Change in number of known or inferred current locations: yes ☐ no ☐ unk ☒
Significant new survey information: yes ☐ no ☒

Explanation:

No significant new data.

Population Information:

Change in number of mature individuals: yes ☐ no ☐ unk ☒
Change in total population trend: yes ☐ no ☐ unk ☒
Change in severity of population fragmentation: yes ☐ no ☒ unk ☐
Change in trend in area and/or quality of habitat: yes ☐ no ☐ unk ☒
Significant new survey information: yes ☐ no ☒

Explanation:

A total of 16 Blue Whales (5 off Newfoundland and 11 in the Gulf of St. Lawrence and Scotian Shelf) were sighted during a 2007 DFO survey of Atlantic Canadian shelf waters from northern Labrador (60°N) to the US border. The survey was designed to increase the likelihood of sighting Blue Whales by apportioning higher effort to areas where they had been sighted previously (Lawson and Gosselin 2009). Too few sightings were obtained to derive an estimate of abundance but the low number of sightings is consistent with previous estimates suggesting there are < 250 mature individuals.

There have been few sightings of Blue Whales in the Gully area of the Scotian Shelf over the past 20 years and no trend has been evident (Whitehead 2011).

Researchers in the Gulf of St. Lawrence report that only 21 calves have been recorded in over 32 years of annual sighting effort (Ramp 2011). Although Blue Whales are present off Newfoundland and Nova Scotia, no cow-calf pairs have been sighted there (Lawson 2011).

There are no new data on overall trends in abundance or habitat quality. The population is not considered to be fragmented.

Threats:

Change in nature and/or severity of threats: yes ☐ no ☐ unk ☒

Explanation:

The threats identified during the 2002 assessment remain and the Blue Whale Recovery Team has identified additional threats and ranked them. There is no indication that the nature or severity of the threats has changed over the past ten years but perceptions and understanding have changed somewhat.

The main sources of human-induced mortality of Blue Whales in the North Atlantic are entanglement in fishing gear and ship strikes (documented in other populations; scars present in this population) although both types of events are rarely observed and reported for Blue Whales in the North Atlantic. Other potential limiting factors are changes in food availability (due, for example, to changes in trophic structure of the ecosystem or climate change through changes to hydrology) and behavioural changes due to increased noise in the marine environment (e.g., from shipping, seismic surveys; see Di Iorio and Clark 2010).

The Blue Whale Recovery Strategy team (Beauchamp *et al.* 2009) identified and ranked anthropogenic threats as follows.

1. High risk threats:
    - Anthropogenic noise (resulting in environmental degradation and change in behaviour)
    - Food availability due to changes in the trophic structure and climate change
2. Medium risk threats:
    - Contaminants
    - Vessel collisions
    - Whale watching
3. Low risk threats:
    - Physical harm from anthropogenic noise
    - Entanglements in fishing gear
    - Epizootics and toxic algal blooms
    - Toxic spills

Protection:

Change in effective protection: yes ☐ no ☒

Explanation:

As of 2005, the Blue Whale (Atlantic population) is listed as Endangered on Schedule 1 of the Canadian *Species at Risk Act* and as such it is currently illegal to kill, harm, harass, capture or take individuals. SARA also provides legal protection for the residence and critical habitat of listed species. However, the Recovery Strategy indicates that available information is insufficient for identifying critical habitat of Blue Whales in Canadian Atlantic waters (Beauchamp *et al.* 2009) and therefore no special protection is afforded in this regard at present.

Rescue Effect:

Evidence of rescue effect: yes ☐ no ☒

Explanation:

It is difficult to determine if rescue is likely. Blue Whales appear to be increasing in the area around Iceland (Northeast Atlantic population) but are rare elsewhere in the North Atlantic.

Quantitative Analysis:

Change in estimated probability of extirpation: yes ☐ no ☒ unk ☐

Details:

No quantitative analysis is available.

Summary and Additional Considerations: [e.g., recovery efforts]

A Recovery Strategy for the Blue Whale in Atlantic Canada (Beauchamp *et al.* 2009) was finalized and published in December 2009. It identifies a recovery goal and outlines recovery objectives.

List of authorities contacted to review the status appraisal:

Marine Mammal SSC members

Lesage, V. March 2011. Research Scientist, Fisheries and Oceans, Canada, Mont Joli, QC

Lawson, J. March 2011. Research Scientist, Fisheries and Oceans, Canada, St. John's, NL

Sears, R. April 2011. Researcher, Mingan Island Cetacean Study, Quebec

Ramp, C. April 2011. Researcher, Mingan Island Cetacean Study, Quebec

Sources of information:

Beauchamp, J., H. Bouchard, P. de Margerie, N. Otis, J.-Y. Savaria. 2009. Recovery strategy for the blue whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. *Species at Risk Act* Recovery Strategy Series, Fisheries and Oceans Canada, Ottawa. 62 pp.

Comtois, S. C. Savenkoff, M.-N. Bourassa, J.-C. Brêthes and R. Sears. 2010. Regional distribution and abundance of blue and humpback whales in the Gulf of St. Lawrence. Canadian Technical Report of Fisheries and Aquatic Sciences 2877. 48pp.

COSEWIC. 2002. COSEWIC assessment and update status report on the Blue Whale *Balaenoptera musculus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 32 pp.

Di Iorio, L. and C.W. Clark. 2010. Exposure to seismic survey alters Blue Whale acoustic communication. Biology Letters 6:51-54.

Lawson, Jack. 2011. Personal Communications March/April 2011. Email correspondence and verbal communications with G. Stenson. Research Scientist, Fisheries and Oceans Canada, Mont Joli, QC.

Lawson, J. W. and J.-F. Gosselin. 2009. Distribution and preliminary abundance estimates for cetaceans seen during Canada's marine megafauna survey – a component of the 2007 TNASS. Canadian Science Advisory Secretariat Research Document 2009/031. 28 pp.

Lesage, Veronique. 2011. Personal Communications March/April 2011. Email correspondence and verbal communications with G. Stenson. Research Scientist, Fisheries and Oceans Canada, Mont Joli, QC.

Ramp, C. 2006. Survival of adult blue whales *Balaenoptera musculus* in the Gulf of St. Lawrence, Canada. Marine Ecology Progress Series 319:287-295.

Ramp, Christian. 2011. Personal Communication, April 2011. Email correspondence with G. Stenson. Researcher, Mingan Island Cetacean Study, QC.

Sears, Richard. 2011. Personal Communication, April 2011. Email correspondence and verbal communications with G. Stenson. April 2011. Researcher, Mingan Island Cetacean Study, QC.

Whitehead, H. 2011. Personal Communications, April 2011. Email correspondence. Professor, Department of Biology, Dalhousie University, Halifax, NS.

TECHNICAL SUMMARY

Balaenoptera musculus
Blue Whale (Atlantic population) Rorqual Bleu (Population de l'Atlantique)
Range of occurrence in Canada (province/territory/ocean): Atlantic Ocean

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines (2008) is being used) [gen(r=0) = average age of mothers at pre-disturbance state, as estimated from a simplified Leslie matrix; Taylor *et al.* (2007)]	32 yr
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Unknown
Estimated percent of continuing decline in total number of mature individuals within 2 generations	Unknown
Suspected percent reduction in total number of mature individuals over the last 3 generations (i.e. since 1915).	Significant decline due to historic whaling; likely greater than 50%
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next 3 generations].	Unknown
Suspected percent reduction in total number of mature individuals over any 3 generations period, including both the past and the future.	Unknown
Are the causes of the decline clearly reversible and understood and ceased? *Despite more than 45 years of full protection from deliberate killing, there is no clear evidence of recovery from the depletion caused by commercial whaling.*	Cause (commercial whaling) has ceased but decline may not be reversible.
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence	> 20,000 km^2
Index of area of occupancy (IAO) (Always report 2x2 grid value).	> 20,000 km^2
Is the total population severely fragmented?	No
Number of locations*	N/A
Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?	Unknown
Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?	Unknown
Is there an [observed, inferred, or projected] continuing decline in number of populations?	N/A
Is there an [observed, inferred, or projected] continuing decline in number of locations*?	N/A
Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat?	Unknown
Are there extreme fluctuations in number of populations?	No
Are there extreme fluctuations in number of locations*?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

* See Definitions and Abbreviations on COSEWIC website and IUCN 2010 for more information on this term.

Number of Mature Individuals (in each population)

Population	N Mature Individuals
Canadian Atlantic population	Likely <250
Total	Likely <250

Quantitative Analysis

Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years].	No quantitative analysis available

Threats (actual or imminent, to populations or habitats)

Known causes of human-induced mortality are ship strikes (documented in other areas and scars present in this population) and entanglements in fishing gear.

Potential threats or limiting factors include changes in food availability (due, for example, to changes in trophic structure of the ecosystem or climate change through changes to hydrology) and behavioural changes due to increased noise in the marine environment (e.g., from shipping, seismic surveys).

Rescue Effect (immigration from outside Canada)

Status of outside population(s)? *Increasing in Iceland, rare elsewhere*	
Is immigration known or possible?	Yes
Would immigrants be adapted to survive in Canada?	Unknown but likely
Is there sufficient habitat for immigrants in Canada?	Unknown
Is rescue from outside populations likely?	Very hard to know

Current Status

COSEWIC: Endangered (May 2012)

Additional Sources of Information:

Beauchamp, J., H. Bouchard, P. de Margerie, N. Otis, J.-Y. Savaria. 2009. Recovery strategy for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic population, in Canada [FINAL]. Species at Risk Act Recovery Strategy Series, Fisheries and Oceans Canada, Ottawa. 62 pp.

Taylor, B.L., Chivers, S.J., Larese, J. and Perrin, W.F. 2007. Generation length and percent mature estimates for IUCN assessments of cetaceans. Southwest Fisheries Science Center, National Marine Fisheries Service, La Jolla Laboratory, Administrative Report LJ-07-01. 18 pp.

Status and Reasons for Designation

Status:	Alpha-numeric Code:
Endangered	A2abd; D1

Reasons for Designation:

Whaling reduced the original population of this species. The population size is unknown but there are likely fewer than 250 mature individuals in Canada. There are also strong indications of a low calving rate and a low rate of recruitment into the population. The known causes of human-induced mortality of this species in Canada and elsewhere are ship strikes and entanglements in fishing gear. The species may also be vulnerable to disturbances due to increased noise in the marine environment (e.g., shipping, seismic surveys) and to changes in the abundance of its prey (zooplankton) through, for example, long-term changes in the climate.

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): Meets Endangered under A2abd as over the past 3 generations (i.e., since ca. 1915) there has been a suspected decline of more than 50% in the total number of mature individuals based on the low numbers of individuals observed in recent surveys (a), the difficulty whalers had in finding and catching Blue Whales (preferred targets) in the last years of commercial whaling (b), and high levels of historic commercial exploitation (d). The cause of the reduction (commercial whaling) has ceased and is understood but the reduction may not be reversible.
Criterion B (Small Distribution Range and Decline or Fluctuation): Not applicable as the extent of occurrence and the index of area of occupancy exceed the thresholds.
Criterion C (Small and Declining Number of Mature Individuals): Not applicable as there is insufficient data to estimate current population trends.
Criterion D (Very Small or Restricted Total Population): Meets Endangered under D1 as the number of mature animals is likely less than 250.
Criterion E (Quantitative Analysis): Not performed.

COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS
(2012)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

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The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.